Docket No.: 059910.P003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Norman C. Fawley

Application No.: 10/695,252

Filed: October 27, 2003

For: **METHOD FOR BENDING COMPOSITE REINFORCED PIPE**

Art Group: 1732

Examiner: Patrick Butler

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

The Appellant submits the following Appeal Brief pursuant to 37 C.F.R. § 41.37(c) for consideration by the Board of Patent Appeals and Interferences. As an Appeal Brief was previously filed on August 13, 2007 along with a fee of $500.00 and a final Board decision was not made with respect to the Appeal Brief of August 13, 2007, the Appellant requests that the previous $500.00 Appeal Brief fee be applied to the filing of the present Appeal Brief. See M.P.E.P. § 1204.01. Further, the Appellant authorizes the amount of $40.00 to cover the additional cost of filing the opening brief as required by 37 C.F.R. § 1.17(f) to be charged to Deposit Account No. 02-2666.

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I. REAL PARTY IN INTEREST

Norman C. Fawley, inventor of the subject application, assigned his rights to the invention disclosed in the subject application through an Assignment recorded on December 14, 2004, at reel and frame 016085/0088 to NCF Industries, Inc., 807-C Main Street, Santa Maria, California, 93458. Therefore, NCF Industries, Inc. is the real party in interest.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences that will directly affect, be directly affected by or have a bearing on the Board's decision in this Appeal.

III. STATUS OF CLAIMS

Claims 1, 4, 6-10, 17, and 18 are pending in the application. Claims 11-16 are withdrawn. Claims 2, 3, and 5 are cancelled. No claims are allowed. Claims 1, 4, 6-10, 17, and 18 stand rejected. Therefore, the Appellant appeals the rejection of claims 1, 4, 6-10, 17, and 18.

IV. STATUS OF AMENDMENTS

The Appellant submitted amendments to claim 1 in a Response to Final Office Action mailed on June 1, 2009. The Examiner noted in the Advisory Action mailed June 15, 2009 that the amendments to claim 1 would not be entered as they allegedly raise new subject matter.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Independent claim 1 recites a method of bending Composite Reinforced Pipe (CRP) (application, p. 1, ¶ 1, lines 9-11; Figure 1) comprising: placing a heater proximate to a plurality of longitudinally displaced locations along the pipe where the pipe is to be bent , the pipe having a composite reinforcement comprising a resin and reinforcement fibers coupled thereto (application, p. 3, ¶ 12, lines 30-35; Figure 1 reference no. 30); heating the pipe to a temperature above a heat distortion temperature of the resin such that the composite reinforcement is heated to a temperature below a heat distortion temperature of the composite reinforcement (application, p. 4, ¶ 12, lines 1-2); and bending the pipe incrementally at the plurality of longitudinally displaced locations (application, p. 4, ¶ 12, lines 4-16; Figure 1), the longitudinally displaced

locations separated by a distance equal to approximately ¼ of a diameter of the pipe (application, p. 4, ¶ 12, lines 7-11).

Dependent claim 17 recites the element of wherein the reinforcement fibers are positioned circumferentially and longitudinally along the pipe (application, p. 5, ¶ 15, lines 2-14).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1, 4, 6-10, 17 and 18 are rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement.

Claims 1, 4, 6, 7 and 9 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Publication No. 2004/0060497 by Smith *et al.* (hereinafter "Smith") in view of U.S. Patent No. 4,132,104 issued to Clavin (hereinafter "Clavin") and European Application No. 1 086 760 issued to Lewis (hereinafter "Lewis") as evidenced by *Handbook of Thermoplastic Elastomers* by Drobny (hereinafter "Drobny").

Claims 8 and 10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Smith in view of Clavin and Lewis as evidenced by Drobny as applied to claim 1 and further in view of U.S. Patent No. 4,255,378 issued to Miller *et al.* (hereinafter "Miller").

Claims 17 and 18 are rejected under 35 U.S.C. §103(a) as being unpatentable over Smith in view of Clavin and Lewis as evidenced by Drobny, and further in view of U.S. Patent No. 5,435,867 issued to Wolfe *et al.* (hereinafter "Wolfe").

All of the claims do not stand or fall together. The basis for the separate patentability of the claims is set forth below.

VII. ARGUMENT

A. Overview of Smith

Smith discloses a method and apparatus for transporting or storing compressed natural gas in a pipeline. See Smith, Abstract. Smith discloses coating the pipeline in reinforcement composites and resin. See Smith, Paragraphs [0006] and [0015]. Smith discloses that the reinforcement composites and resin can be applied to a bent pipe or a straight pipe. See Smith, Paragraph [0015].

Smith fails to disclose a method of bending a composite reinforced pipe including

bending the pipe at longitudinally displaced locations separated by a distance equal to approximately ¼ of a diameter of the pipe. Further, Smith fails to disclose positioning reinforcement fibers circumferentially and longitudinally along a pipe that is to be bent.

B. Overview of Clavin

Clavin generally discloses a method and apparatus for bending coated pipe and heating of sections of the pipe coating by resistance heating to prevent damage to the pipe coating during bending of the pipe. See Clavin, Abstract. Clavin discloses that the pipe coating may be formed of a uniform continuous layer of plastic or resin. See Clavin, Column 3, Lines 53-55. Clavin discloses that a pipe can be bent 1° at increments equal to the diameter of the pipe.

Clavin does not disclose a separation distance between bends of a pipe. Further, Clavin fails to disclose positioning reinforcement fibers circumferentially and longitudinally along a pipe that is to be bent.

C. Overview of Lewis

Lewis generally discloses a pipe bending system including a feedback and control system that provides continuous data to a programmed processor. See Lewis, Abstract. The system includes a conventional pipe bender and an apparatus for axially moving the pipe with respect to the pipe bender. See Lewis, Paragraph [0016]. The system further includes an encoder to provide an electrical signal corresponding to the linear distance the pipe has moved. See Lewis, Paragraph [0018]. The system further includes a processor to carry out bending parameters. See Lewis, Paragraph [0038].

Lewis fails to disclose a method of bending a composite reinforced pipe including bending the pipe at longitudinally displaced locations separated by a distance equal to approximately ¼ of a diameter of the pipe. Further, Lewis fails to disclose positioning reinforcement fibers circumferentially and longitudinally along a pipe that is to be bent.

D. Overview of Miller

Miller generally discloses a process and jig for field bending of large diameter plastic pipes. See Miller, Abstract. The jig includes adjustable left and right hand guide assemblies along a spreader tube. See Miller, Abstract. A plastic pipe may be inserted through the guide assemblies. See Miller, Figure 1. To form a bend in the pipe, plugs are placed at the ends of the pipe so that pressurized air is trapped within the pipe when heat is applied to prevent the wall from buckling upon formation of the bend. See Miller, Column 5, Lines 25-29.

Miller fails to disclose a method of bending a composite reinforced pipe including bending the pipe at longitudinally displaced locations separated by a distance equal to approximately ¼ of a diameter of the pipe. Further, Miller fails to disclose positioning reinforcement fibers circumferentially and longitudinally along a pipe that is to be bent.

E. Overview of Wolfe

Wolfe discloses a tubular structure, such as a pipe or pressure vessel, with a wall formed from plastic, composites and elastomeric materials. See Wolfe, Abstract. The composite materials are spirally wound around the pipe. See Wolfe, Abstract. Wolfe discloses that positioning reinforcement fibers circumferentially and longitudinally along a pipe should be used when the pipe is static and will not be flexed or bent. See Wolfe, Column 3, Lines 15-35.

Wolfe fails to disclose a method of bending a composite reinforced pipe including bending the pipe at longitudinally displaced locations separated by a distance equal to approximately ¼ of a diameter of the pipe. Further, Wolfe fails to disclose positioning reinforcement fibers circumferentially and longitudinally along a pipe that is to be bent.

F. Overview of Drobny

Drobny discloses general methods for performing induction welding. See Drobny, § 4.12.2.8. Drobny discloses that in induction wielding heat is generated from interaction of a magnetic field with a ferromagnetic field and from current induced in the metal. See Drobny, § 4.12.2.8.

Drobny fails to disclose a method of bending a composite reinforced pipe including bending the pipe at longitudinally displaced locations separated by a distance equal to approximately ¼ of a diameter of the pipe. Further, Drobny fails to disclose positioning reinforcement fibers circumferentially and longitudinally along a pipe that is to be bent.

G. Rejection of Claims 1, 4, 6-10, 17, and 18 Under 35 U.S.C. § 112, First Paragraph

Claims 1, 4, 6-10, 17 and 18 are rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement.

The Examiner alleges that the phrase "placing a heater proximate to...a plurality of longitudinally displaced locations" as recited in claim 1 is not supported in the Specification as filed. See Final Office Action, Page 2. Specifically, the Examiner states that this element of claim 1 includes having multiple heaters which is allegedly not disclosed in the Specification as

filed. See *Id.* The Appellant submits that, a person of ordinary skill in the art would not reasonably interpret claims 1, 4, 6-10, 17 and 18 as having multiple heaters.

"During patent examination, the pending claims must be 'given their broadest reasonable interpretation consistent with the specification.'" M.P.E.P. § 2111 quoting Phillips v. AWH Corp., 75 USPQ2d 1321 (Fed. Cir. 2005). "The broadest reasonable interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach." M.P.E.P § 2111 citing *In re* Cortright, 49 USPQ2d 1464, 1468 (Fed. Cir. 1999). "Ordinary, simple English words whose meaning is clear and unquestionable, absent any indication that their use in a particular context changes their meaning, are construed to mean exactly what they say." M.P.E.P. § 2111.01(I) citing Chef America, Inc. v. Lamb-Weston, Inc., 69 USPQ2d 1857 (Fed. Cir. 2004).

Claim 1 recites "placing a heater proximate to...a plurality of longitudinally displaced locations" (emphasis added). Further, the Appellant is not attempting to apply a definition separate from the plain meaning of each of these terms. Accordingly, the terms of this element of claim 1 should be afforded their plain meaning during prosecution. The ordinary plain meeting of "a heater" as would be understood by a person of ordinary skill in the art is a *single* heater and not a plurality of heaters as argued by the Examiner. The fact that "a heater" is placed proximate a plurality of longitudinally displaced locations does not reasonably imply that a plurality of heaters are placed next to the plurality of locations. For example, a single heater may be large enough to be proximate to multiple longitudinally displaced locations. Therefore, a person of ordinary skill in the art could reasonably interpret claim 1 to recite a single heater which is proximate to and heats a plurality of longitudinally displaced locations.

Alternatively, although not expressly recited, the claims do not preclude the inclusion of a step for moving the pipe or the heater such that multiple longitudinally displaced locations of the pipe are heated. Claim 1 includes the transition phrase "comprising" which has been interpreted by the Federal Circuit as being open-ended. The M.P.E.P. notes that the "transitional term 'comprising', which is synonymous with 'including,' 'containing,' or 'characterized by,' is inclusive or open-ended and does not exclude additional, unrecited elements or method steps." M.P.E.P. § 2111.03 citing Mars Inc. v. H.J. Heinz Co., 71 USPQ2d 1837, 1843 (Fed. Cir. 2004). Thus, claim 1 does not preclude a step for moving the pipe or the heater such that a plurality of longitudinally displaced locations are heated prior to being bent by using a single heater, because

claim 1 does not preclude this step from occurring. Therefore, a person of ordinary skill in the art could reasonably interpret claim 1 to recite multiple longitudinally displaced locations of a pipe moved in relation to a single heater or a single heater moved in relation to multiple longitudinally displaced locations of a pipe such that each of the locations are heated by a single heater, because claim 1 does not preclude these steps from being performed.

Thus, for at least the reasons provided above, a person of ordinary skill in the art could reasonably interpret claims 1, 4, 6-10, 17 and 18 as reciting a single heater. Consequently, the broadest reasonable interpretation of these claims would include a single heater. Therefore, the Examiner improperly interpreted the claims to include multiple heaters, because the Examiner did not afford the claims their broadest reasonable interpretation.

Accordingly, the Appellant respectfully requests that the § 112 rejection of claims 1, 4, 6-10, 17 and 18 be overturned.

H. Rejection of Claims 1, 4, 6-10, 17, and 18 Under 35 U.S.C. § 103(a)

Claims 1, 4, 6, 7 and 9 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Publication No. 2004/0060497 by Smith *et al.* (hereinafter "Smith") in view of U.S. Patent No. 4,132,104 issued to Clavin (hereinafter "Clavin") and European Application No. 1 086 760 issued to Lewis (hereinafter "Lewis") as evidenced by *Handbook of Thermoplastic Elastomers* by Drobny (hereinafter "Drobny").

Claims 8 and 10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Smith in view of Clavin and Lewis as evidenced by Drobny as applied to claim 1 and further in view of U.S. Patent No. 4,255,378 issued to Miller *et al.* (hereinafter "Miller").

Claims 17 and 18 are rejected under 35 U.S.C. §103(a) as being unpatentable over Smith in view of Clavin and Lewis as evidenced by Drobny, and further in view of U.S. Patent No. 5,435,867 issued to Wolfe *et al.* (hereinafter "Wolfe").

To determine obviousness of a claim: (1) factual findings must be made under the factors set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966); and (2) the analysis supporting the rejection under 35 U.S.C. § 103 should be made explicit and there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. See MPEP §§ 2141(II), 2141(III), and 2142; KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385, 1396; see e.g., MPEP § 2143 (providing a number of rationales which

are consistent with the proper "functional approach" to the determination of obviousness as laid down in Graham).

However, as discussed below, the cited reference fails to teach or suggest each element of claims 1, 4, 6-10, 17, and 18.

1. **Claims 1, 4, and 6-10**

a) Independent Claims 1 is patentable at least because the combination of Smith, Clavin, Lewis, and Drobny fails to disclose bending a pipe incrementally at a plurality of locations that are separated by a distance equal to approximately ¼ of a diameter of the pipe.

Independent claim 1 recites "bending the pipe incrementally at the plurality of longitudinally displaced locations, the longitudinally displaced locations separated by a distance equal to approximately ¼ of a diameter of the pipe" (emphasis added). The combination of Smith, Clavin, Lewis and Drobny does not teach or suggest these elements.

The Examiner relies on the combination of Clavin with Lewis to disclose these elements of claim 1. See Final Office Action, Pages 3-5. Specifically, the Examiner states that Clavin discloses bending a pipe a single 1° at increments equal to the diameter of the pipe. See Final Office Action, Pages 8 and 9. Further, the Examiner asserts that Lewis discloses bending a pipe through cumulative ¼° bends. See *Id.* The Examiner concludes that it would be obvious to incrementally bend the pipe of Clavin in ¼° increments at an incremental distance of ¼ the diameter the length along the pipe. See *Id.* However, the Examiner has failed to establish clear motivation for modifying Clavin based on incremental ¼° bends every ¼ of the diameter of the pipe.

In making a determination of obviousness, the Examiner must not rely on hindsight reasoning. See M.P.E.P. § 2145(X)(A). Specifically, the Examiner may rely on "only knowledge which was within the level of ordinary skill in the art at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure, such a reconstruction is proper." M.P.E.P. § 2145(X)(A) quoting In re McLaughlin, 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971).

Clavin discloses that a pipe can be bent 1° at increments equal to the diameter of the pipe. This is the only disclosure in Clavin regarding the spacing between bends. Further, Lewis does

not disclose a distance for spacing bends. In arguing that the combination of Lewis and Clavin discloses bending a pipe incrementally every ¼ of a diameter of the pipe, the Examiner engages in impermissible hindsight driven analysis. Specifically, the Examiner argues that a person of ordinary skill in the art would modify the express teachings of Clavin, which disclose the benefits of bending a pipe at increments equal to the full diameter of the pipe, to instead bend the pipe every ¼ of the diameter of the pipe, which is not disclosed in either reference. This modification is allegedly based on the disclosure of Lewis. However, Lewis is silent in regard to the distance between ¼° bends in a pipe. The Examiner is assuming that a person of ordinary skill in the art would bend a pipe at increments equal to ¼ of the diameter of the pipe even though there is no disclosure of this cited spacing in either reference. The Appellant submits that the Examiner is basing this assumption to bend a pipe at increments equal to ¼ of the diameter of the pipe on the Applicant's disclosure, because there is no teaching or suggestion in either Clavin or Lewis to separate bends by this measurement. Therefore, the Examiner's argument is based on impermissible hindsight driven analysis, because it is based on knowledge gleaned only from Applicant's disclosure instead of the cited prior art in contradiction to M.P.E.P. § 2145(X)(A).

Thus, the Examiner has failed to establish a *prima facie* case of obviousness under 35 U.S.C. § 103, because the Examiner has not provided valid reasoning for modifying Clavin based on Lewis. Further, the Examiner has not cited and the Appellant has been unable to locate any sections of Smith or Drobny which disclose these elements of claim 1.

Thus, for the reasons outlined above the combination of Smith, Clavin, Lewis, and Drobny does not disclose "bending the pipe incrementally at the plurality of longitudinally displaced locations, the longitudinally displaced locations separated by a distance equal to approximately ¼ of a diameter of the pipe." Therefore, the combination of Smith, Clavin, Lewis, and Drobny fails to disclose each element of claim 1, and therefore cannot form the basis of a rejection under 35 U.S.C. § 103.

b) Dependent Claims 4, 6, 7, and 9 depend from a patentable base claim.

Dependent claims 4, 6, 7, and 9 depend from base claim 1 and incorporate the limitations thereof. Thus, for at least the reasons discussed above in connection with claim 1, the combination of Smith, Clavin, Lewis, and Drobny fails to teach or suggest each element of claims 4, 6, 7, and 9. Therefore, claims 4, 6, 7, and 9 are patentable over the art of record

because each of these claims depends from claim 1.

Thus, in view of at least the foregoing reasons, claims 4, 6, 7, and 9 are directed toward allowable subject matter. Accordingly, the Appellant respectfully requests that the § 103 rejection of claims 4, 6, 7, and 9 be overturned.

2. Claims 8 and 10

a) Dependent Claims 8 and 10 depend from a patentable base claim.

Dependent claims 8 and 10 depend from base claim 1 and incorporate the limitations thereof. Thus, for at least the reasons discussed above in connection with claim 1, the combination of Smith, Clavin, Lewis, and Drobny fails to teach or suggest each element of claims 8 and 10. Further, the Examiner has not cited and the Appellant has been unable to locate any sections of Miller which cure the deficiencies of the combination of Smith, Clavin, Lewis, and Drobny. Therefore, claims 8 and 10 are patentable over the art of record because each of these claims depends from claim 1.

Thus, in view of at least the foregoing reasons, claims 8 and 10 are directed toward allowable subject matter. Accordingly, the Appellant respectfully requests that the § 103 rejection of claims 8 and 10 be overturned.

3. Claims 17 and 18

a) Dependent Claim 17 depends from a patentable base claim.

Claim 17 depends from claim 1 and incorporates the limitations thereof. Thus, for at least the reasons discussed above in connection with claim 1, the combination of Smith, Clavin, Lewis, and Drobny fails to teach or suggest each element of claim 17. Further, the Examiner has not cited and the Appellant has been unable to locate any sections of Wolfe which cure the deficiencies of the combination of Smith, Clavin, Lewis, and Drobny. Therefore, claim 17 is patentable over the art of record because this claim depends from claim 1.

b) Dependent Claims 17 is patentable at least because the combination of Smith, Clavin, Lewis, Drobny, and Wolfe fails to disclose positioning reinforcement fibers circumferentially and longitudinally along a pipe.

Dependent claim 17 recites "the reinforcement fibers are positioned circumferentially and longitudinally along the pipe." The combination of Smith, Clavin, Lewis, Drobny, and Wolfe does not teach or suggest these elements.

The Examiner argues that Wolfe discloses positioning reinforcement fibers circumferentially and longitudinally along a pipe. See Final Office Action, Page 7. Specifically, the Examiner cites column 2, line 59 through column 3, line 2 of Wolfe to allegedly disclose these elements of claim 17. See *Id.* These sections of Wolfe disclose positioning reinforcement fibers circumferentially and longitudinally along a pipe when no torsional forces are applied to the pipe. See *Id.* In sections not cited by the Examiner, Wolfe notes that positioning reinforcement fibers circumferentially and longitudinally along a pipe should be used when the pipe is static and will not be flexed or bent. See Wolfe, Column 3, Lines 15-35. Particularly, Wolfe notes that the arrangement of a reinforcement structure using a combination of longitudinal fibers and circumferential fibers with a non-static pipe is problematic. See Wolfe, Column 3, Line 56 through Column 4, Line 44. By using a differing directional orientation of fiber reinforcement (i.e. longitudinal fibers and circumferential fibers), the resulting reinforced structure has an inconsistent strength and is unpredictable. See *Id.* To correct the inconsistencies caused by the use of longitudinal fibers and circumferential fibers, Wolfe proposes using spirally wound fibers. See Wolfe, Figures 1, 2, and 4-22 and Column 5, Line 55 through Column 6, Line 18. Therefore, Wolfe teaches away from using a combination of longitudinal fibers and circumferential fibers, because Wolfe notes that use of fibers in this fashion with a non-static pipe is problematic. Thus, a person of ordinary skill in the art would not have read Wolfe and have been motivated to modify the pipe of Smith by reinforcing the pipe with a combination of longitudinal fibers and circumferential fibers, because Wolfe teaches away from use of a combination of longitudinal fibers and circumferential fibers. As a result, Wolfe fails to teach or suggest this element of claim 17.

Further, the Examiner has not cited and the Appellant has been unable to locate any sections of Clavin, Lewis, or Drobny which cure the deficiencies of Smith and Wolfe. Thus, for

the reasons outlined above the combination of Smith, Clavin, Lewis, Drobny, and Wolfe does not disclose "the reinforcement fibers are positioned circumferentially and longitudinally along the pipe." Therefore, the combination of Smith, Clavin, Lewis, Drobny, and Wolfe fails to disclose each element of claim 1, and therefore cannot form the basis of a rejection under 35 U.S.C. § 103.

Thus, in view of at least the foregoing reasons, claim 17 is directed toward allowable subject matter. Accordingly, the Appellant respectfully requests that the § 103 rejection of claim 17 be overturned.

c) Dependent Claim 18 depends from a patentable base claim.

Dependent claim 18 depends from base claim 17 and incorporates the limitations thereof. Thus, for at least the reasons discussed above in connection with claim 17, the combination of Smith, Clavin, Lewis, and Drobny fails to teach or suggest each element of claim 18. Therefore, claim 18 is patentable over the art of record because this claim depends from claim 17.

Thus, in view of at least the foregoing reasons, claim 18 is directed toward allowable subject matter. Accordingly, the Appellant respectfully requests that the § 103 rejection of claim 18 be overturned.

In view of the above arguments, the Appellants respectfully request that the rejection of all claims be overturned.

Respectfully submitted,

BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP

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CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being submitted to the United States Patent and Trademark Office electronically via EFS Web on the date shown below.

Jessica Huester

2009-09-08

Date

VIII. CLAIMS APPENDIX

1. (Previously Presented) A method of bending Composite Reinforced Pipe (CRP) comprising:

placing a heater proximate to a a plurality of longitudinally displaced locations along the pipe where the pipe is to be bent, the pipe having a composite reinforcement comprising a resin and reinforcement fibers coupled thereto;

heating the pipe to a temperature above a heat distortion temperature of the resin such that the composite reinforcement is heated to a temperature below a heat distortion temperature of the composite reinforcement; and

bending the pipe incrementally at the plurality of longitudinally displaced locations, the longitudinally displaced locations separated by a distance equal to approximately ¼ of a diameter of the pipe.

2. (Cancelled)

3. (Cancelled)

4. (Original) The method of Claim 1 wherein a plurality of bends effect approximately 1° of total bend in a longitudinal length equal to a diameter of the CRP.

5. (Cancelled)

6. (Previously Presented) The method of Claim 1 wherein the pipe is bent 1/4° at each location.

7. (Original) The method of Claim 1 further comprising:

preheating the pipe prior to heating the pipe.

8. (Original) The method of Claim 1 further comprising:

capping the pipe to prevent heat loss.

9. (Original) The method of Claim 1 wherein the heater is an induction heater.

10. (Original) The method of Claim 7 wherein preheating comprises:

introducing hot air into the CRP.

11. (Withdrawn) An apparatus for bending a section of composite reinforced pipe comprising:

a frame;

a die mounted on the frame;

a pin up shoe for securing the section of pipe against the die;

a stiffback movably mounted on the frame for bending the section of pipe against the die;

a heater for elevating the temperature of the section of pipe; and

means for longitudinally positioning the section of pipe in the apparatus.

12. (Withdrawn) The apparatus of claim 11 wherein the heater is an induction heater.

13. (Withdrawn) The apparatus of claim 12 wherein the heater encircles the section of pipe.

14. (Withdrawn) The apparatus of Claim 11 wherein the die is segmented.

15. (Withdrawn) The apparatus of Claim 11 further comprising:

an indexing wheel; and

a controller to activate the die responsive to the indexing wheel.

16. (Withdrawn) The apparatus of Claim 11 wherein the means for longitudinally positioning comprising:

a powered roller to translate the pipe in either a forward or reverse direction.

17. (Previously Presented) The method of claim 1 wherein the reinforcement fibers are positioned circumferentially and longitudinally along the pipe.

18. (Previously Presented) The method of claim 17 wherein a number of longitudinal fibers is greater than a number of circumferential fibers.

IX. EVIDENCE APPENDIX

No evidence is submitted with this appeal.

X. RELATED PROCEEDINGS APPENDIX

No related proceedings exist.